Remarks

Claims 1-11 and 15-27 were pending in the application. Claims 1-6, 9-11, 15-18, and 21-27 were rejected. Claims 7, 8, 19, and 20 were merely objected to and no claims were allowed. By the foregoing amendment, claims 9 and 23 are canceled, claims 1, 10, 22 and 25 are amended, and claims 28 and 29 are added. No new matter is presented.

Allowable Subject Matter

Applicant appreciates the indication of allowable subject matter in claims 7, 8, 19, and 20. Claim 7 has been represented in independent form as claim 28; claim 8 has been rewritten in dependent form therefrom as claim 29.

Interview request

In the interest of advancing examination, other dependent claim elements have been incorporated into the independent claims to further limit to geared turbofan use. Applicant requests a telephone interview August 8 2007, with the examiner to discuss these.

Also, information on the exact nature of the Ono et al. and Okamoto et al combination is sought in view of the apparent inconsistencies noted below

Claims Rejections-35 U.S.C. 103

Claims 1-5, 10, 26, and 27 were rejected under 35 U.S.C 103(a) as being unpatentable over Ono et al. (US6273612) in view of Okamoto et al. (US6089755). Applicant respectfully traverses the rejection.

It is unclear which reference is the primary reference and which is the secondary. Although Ono et al. is named as the primary, it is treated as secondary at page 2 fourth line from bottom (despite and contrary to page 5 protestations).. This is relevant as complicating the fact that the office action never articulated the exact structure of the combination.. The two provide greatly different modifications to what appears to be the same baseline bearing system. This begs the questions of: (1) how is it the Office proposes to combine (rather than simply finding words in the two references and combining the words, what is the actual physical combination?); and (2) why did not the common assignee make the proposed combination in at least one of the references.

Ono et al. discloses a crank shaft or crank pin bearing (col. 1, lines 7-8) having a journal with two segments or halves 9 and 10 (more properly analogized to the substrate), a bearing alloy 12 on the steel backing metal 11 of both halves (col. 5, line 5), and various partial overlay layers such as the cited 16. These overlays are: (1) additions to the basic combination of bearing alloy (Cu or Al) 12 and steel backing metal 11; and (2) form departures from the circularity of the ID surface of the baseline sleeve (i.e., protruding downward as shown in the cover figure).

A segment has, in the seventh embodiment (of seven numbered embodiments among other modifications outlined at col. 9, lines 31 *et seq.*), a circumferentially varying lubricant concentration of a solid lubricant in a resin (col. 8, line 59-col. 9, line 13). Thus, contrary to the representation in the Office action that the layer varies in "concentration of the solid lubricant along the engagement length...", the concentration is constant along the engagement length but varies circumferentially. Office action, page 2, third full paragraph. No citations have been provided for asserted teachings of Ono et al. contrary to 35 U.S.C. 132(a). There is no citation for the alleged assertion of equivalence between concentration and thickness. Ono et al. is actually contrary to the Office's assertion. For example, identified change in concentration is in addition to the change in thickness as opposed to a substitute therefor. Col. 8, lines 45-48.

Okamoto et al. discloses use of a longitudinally-varying bearing material thickness of the Cu or Al alloy bearing material to provide an elastic deformation profile that addresses load fluctuations in a crankshaft bearing. Unlike Ono et al., Okamoto et al. FIG. 1 clearly shows that the thickness variation does not alter the shape of the journal-engaging surface (to depart from circular)The thickness variation is reflected in a corresponding change in the thickness of the back metal 4 (Ono's 11).

Okamoto et al. does not suggest modifications to address operation after a lubricant loss in a geared turbofan transmission. The page 2 assertion to modify Okamoto et al. "... to accommodate the high loads at the ends of the longitudinal direction" is circular logic and without support. There is no indication that one of ordinary skill in the art would have appreciated that Okamoto et al. needed any change to achieve that result, let alone a particular change based upon Ono et al.

What is the precise nature of the asserted modification? Is it merely to substitute varying lubricant concentration for varying thickness? Where does Okamoto et al. have a concentration that would be subject to variance? Would one instead be adding an overlayer to Okamoto et al.?

The question is begged as to why, if obvious, did not Ono et al make the substitution (the two being commonly assigned).

There is further no evidence that the proposed modification would not defeat the load carrying function of Okamoto et al. Okamoto et al. ties their variation to Young's modulus. Abstract. Ono et al. ties theirs to heat emission. Abstract

Even if combined, there is still no suggestion for the concentration of claim 3. There is no suggestion that the split segments of the two references in the crank field would yield optimization in the claimed range.

Regarding claims 4, 5, 10, 26 and 27, there appears to be an a la carte mixing of embodiments in citing Ono et al. elements. The Office action inconsistently applies the element 12 of Ono et al as the substrate and also as base material, vitiating the distinction. Note the inconsistent application at the second full paragraph of page 5.

As noted above, the backing metal 11 of segments 9&10 are more properly analogized to the present substrate. Would the proposed combination add an overlayer to the present bearing material (base material & solid lubricant) rather than changing their composition without adding an overlayer? The last sentence of the second full paragraph of page 5 appear to indicate that the combination involves a resin matrix overlay. If that is the case, how can the surface comprise copper as in claim 5.

Claims 26 and 27 distinguish the cited resin overlay of Ono et al.

There has been no proper structural analysis of the means-plus-function claim 10 as is required by *In re. Donaldson*. For example, if the Office action is attempting to use an odd verbal jujitsu wherein a Frankenstinian combination of the references is asserted to incidentally literally anticipate the broad structural claim, there is no basis to assume any functional equivalence. What is the exact nature of the proposed combination and how does it compare to the structure disclosed in the specification? The asserted Ono et al. embodiment involves a local varying thickness overlay of molybdenum disulfide within a resin along the upper half of a bearing. This has not been compared to the structure disclosed in the present specification despite the conclusory statement at lines 4-5 of page 3. What is the structure of the combination. For example, is a local resin overlay asserted as the equivalent structure?

The page 4 remarks clearly vitiate the claim 1 element of length. The remarks ignore that

the teaching s are for a limited purpose in a particular overlay in a particular location in a particular bearing.

Claims 6 and 11 were rejected under 35 U.S.C 103(a) as being unpatentable over Ono et al. in view of Okamoto et al. and further in view of Andler et al. (US6139191) Applicant respectfully traverses the rejection.

Andler et al. was cited for the lead/copper combination. Andler et al. discloses a half bearing with a circumferentially-varying lubricant concentration. Specifically, Andler et al. discloses a steel shell 3, CuPbSn alloy 4, a Ni diffusion barrier 5, and an AlSn20Cu overlay 6. Concentration varies circumferentially within the overlay (confused by the Office action at several places with the CuPbSn alloy 4). The particular half appears as a lower half (as distinguished from Ono et al.

Andler et al. does not indicate in what field that bearing is used. Some such bearings are believed used in the automotive engine industry. Andler et al has a circumferentially varying composition. There is a higher lubricant concentration near the circumferential center (apex area 8) than near the circumferential ends 9. The high loading at area 8 may, for example, be due to the weight of the shaft or to the action of the engine.

The Office action confuses the overlay 6 and alloy 4. Andler et al. did not purport to have invented Cu-Pb combinations. These would have been available for Ono et al. or Okamoto et al. who chose not to use them and thereby taught away.

Andler et al does not suggest modifications to address operation after a lubricant loss in a geared turbofan transmission. There is no suggestion, other than hindsight reconstruction, to make changes from Andler et al. to Ono et al. or Okamoto et al. or their combination.

The Office action basically takes the position that it would be obvious to apply any and all prior lubrication systems modified in any and all prior ways to any and all particular situations with a lack of any specific suggestion to do so. This is improper. This further fails to consider the October 26, 2006 declaration of Michael C. McCune which further attests to the nonobviousness of the claimed invention and impropriety of the proposed combinations.

Claims 9, 15-18, and 21-25 were rejected under 35 U.S.C 103(a) as being unpatentable over Ono et al. in view of Okamoto et al. and further in view of McCreary (US4719818).

Applicant respectfully traverses the rejection.

McCreary was cited as disclosing "a bushing and journal pin assembly for a geared turbofan transmission..." Office action, page 3, last paragraph. However, McCreary relates to a turbocharger for a diesel engine. However, the admitted prior art cited in the present application may serve the purposes for which McCreary is cited. Nevertheless, there is no suggestion for the proposed combination. It was asserted as obvious "to utilize the bushing assembly of Ono in other known devices including that of a turbofan transmission, because McCreary discloses the use of a bushing obtained by plating" *Id.* This is conclusory, unsupported, and simply wrong. Nothing in any of the asserted combinations is supported by a proper motivation other than hindsight. Supporting of cranks, gears, and turbines all have distinct problems and considerations. For example, there is no suggestion to adopt the split automotive crank bearing construction of Okamoto et al. in the present geared turbofan engine or in the turbocharger of McCreary. Given the differences, something more than a conclusory statement is required.

The Office action appears to take the position that as long as all the individual word elements can be found in the prior art, the claim is obvious. This is simply wrong. What would cause one of ordinary skill in McCreary's art, let alone the geared turbofan transmission art to seek modification based upon this reference from a different art?

It is clear that the combination is merely a hindsight reconstruction. Only if the examiner were to tell one of ordinary skill in the art exactly what combination should be made, would one make that combination. For example, why wouldn't one have selected a combination whereby a transmission received Ono et al's or Andler et al's circumferential variation and/or variation in relative thickness .

Accordingly, Applicant submits that claims 1-8, 10-11, 15-22, and 24-29 are in condition for allowance. Please charge any fees or deficiency or credit any overpayment to our Deposit Account of record.

Respectfully submitted,

By /William B. Slate #37238/
William B. Slate
Attorney for Applicant

Reg. No.: 37,238

Telephone: 203-777-6628
Telefax: 203-865-0297

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